SNELL & WILCOX
Engineering with Vision

Standards Conversions

HD Technology Briefing

November 22nd

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Standards Conversion

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- De-interlacing
- Conversion Techniques
- Common Issues

De-interlacing

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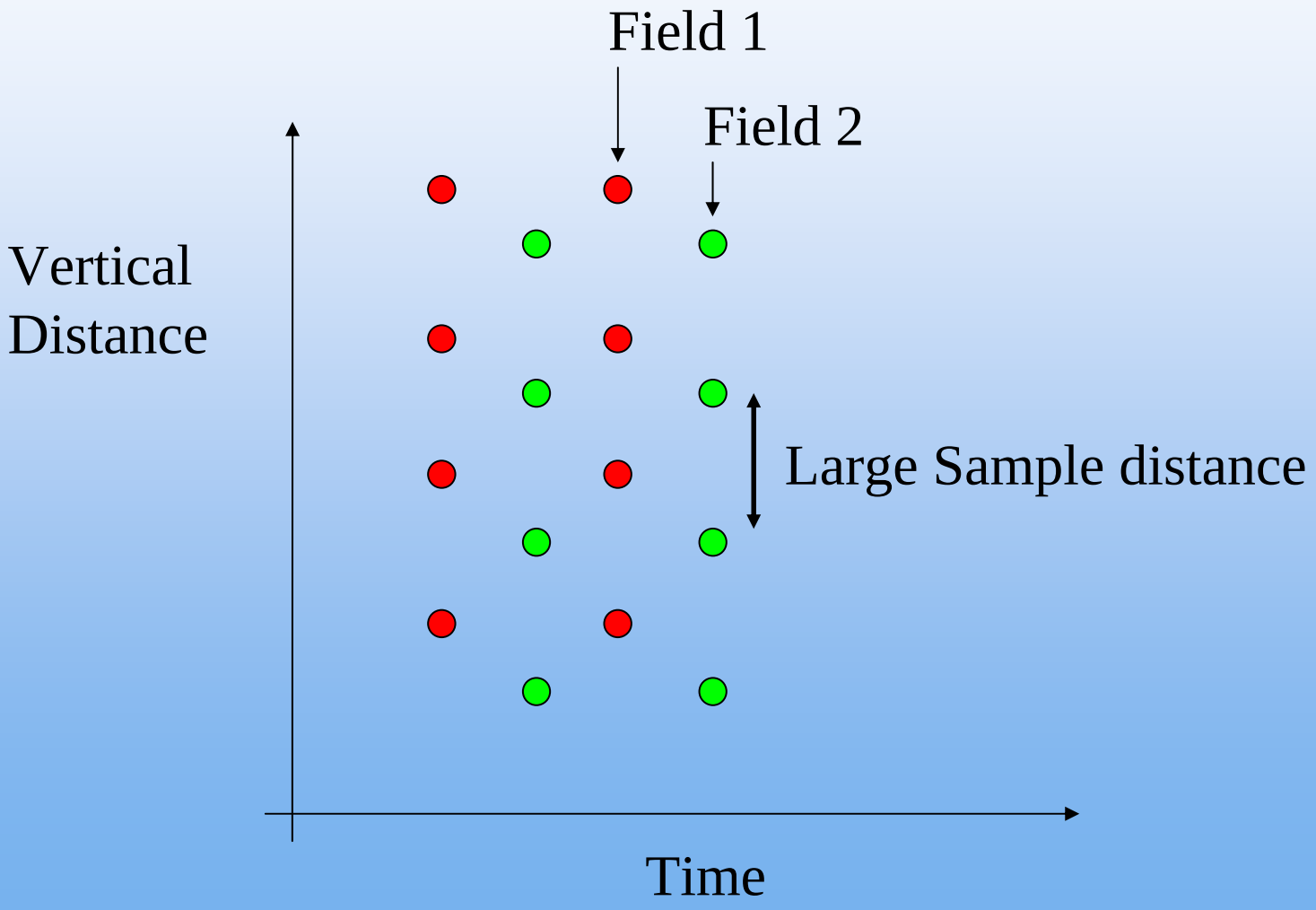
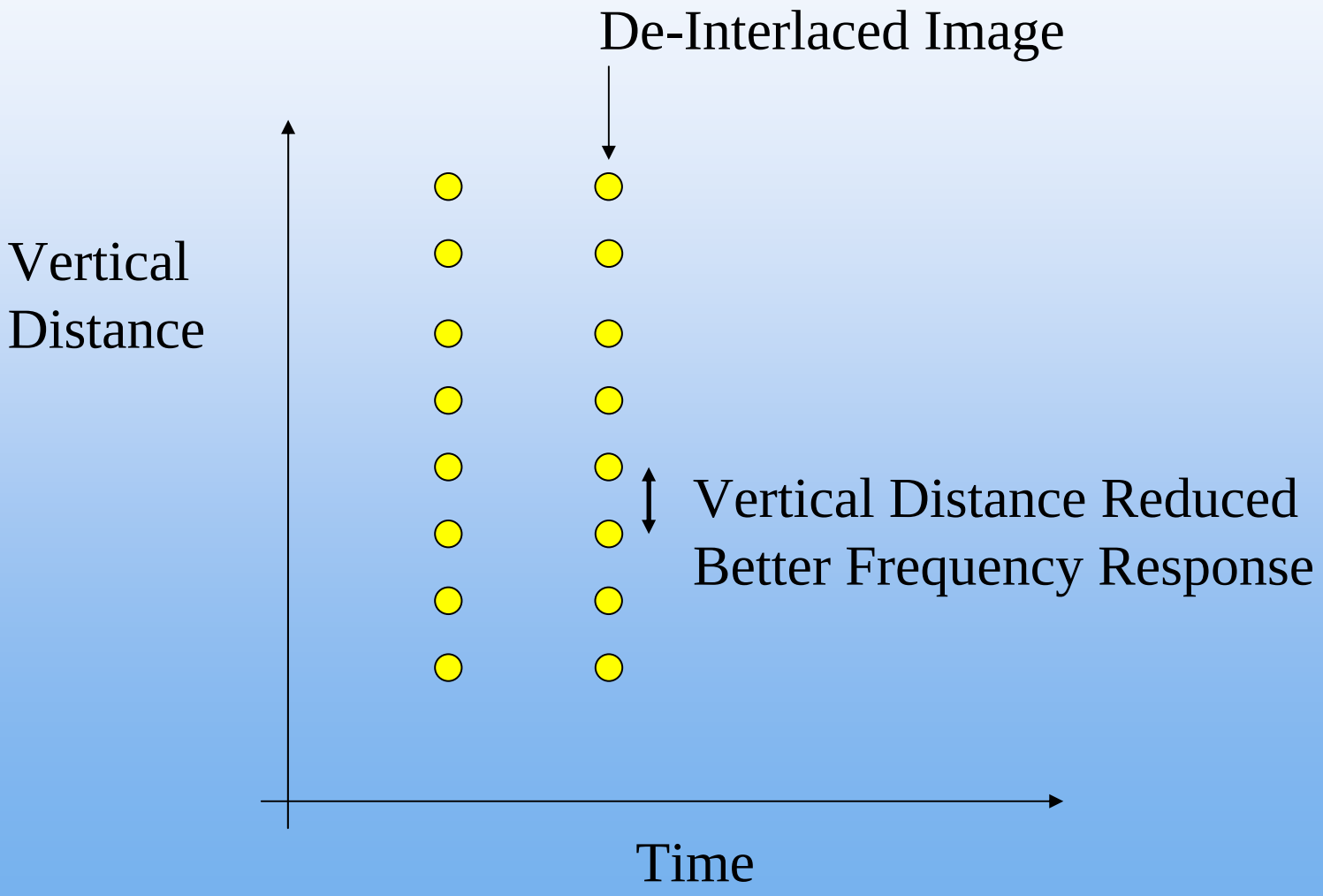
- Why is de-interlacing important?
  - Progressive production standards
    - 1080 24P/sF, 720 59P, 720 50P
  - Progressive broadcast standards
    - 720 59P, 720 50P
  - Progressive scan displays
    - LCD and Plasma
  - Many Sources are interlaced
    - 625 50i, 525 59i, 1080 50i, 1080 59i
  - Maximise resolution
- It’s the key to quality HD conversion

Interlace


Field 1
Field 2
Vertical Distance
Large Sample distance
Time

De-Interlace



Techniques: Linear (1)

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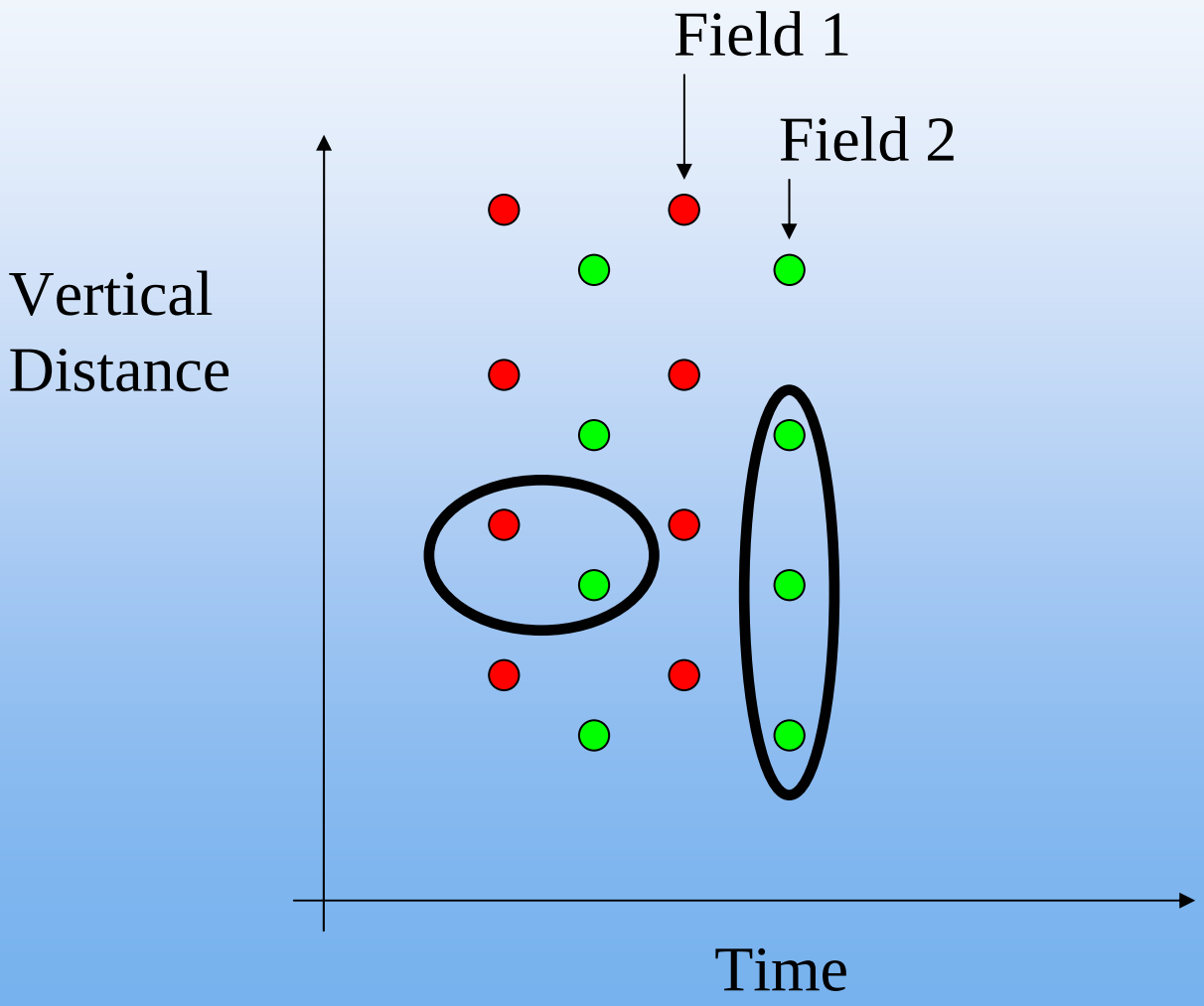
- Linear
  - Bob (spatial)
  - Weave (temporal)
  - VT (Vertical Temporal)
- VT Apertures
  - Sports, Studio
  - Film, Video
- Pitfalls
  - Resolution
  - Global artefacts

Techniques: Linear (2)



Techniques: Non-Linear

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- Increased performance with movement
- Motion Adaptive
  - Constant variation
  - Global
  - Pixel
- Greater Processing Needs
  - Commercially available chipsets
  - VXP by Gennum, HQV from Silicon Optix/Teranex
- Pitfalls
  - Resolution pumping
  - Local pixel based errors

Techniques:
Motion Compensation (1)

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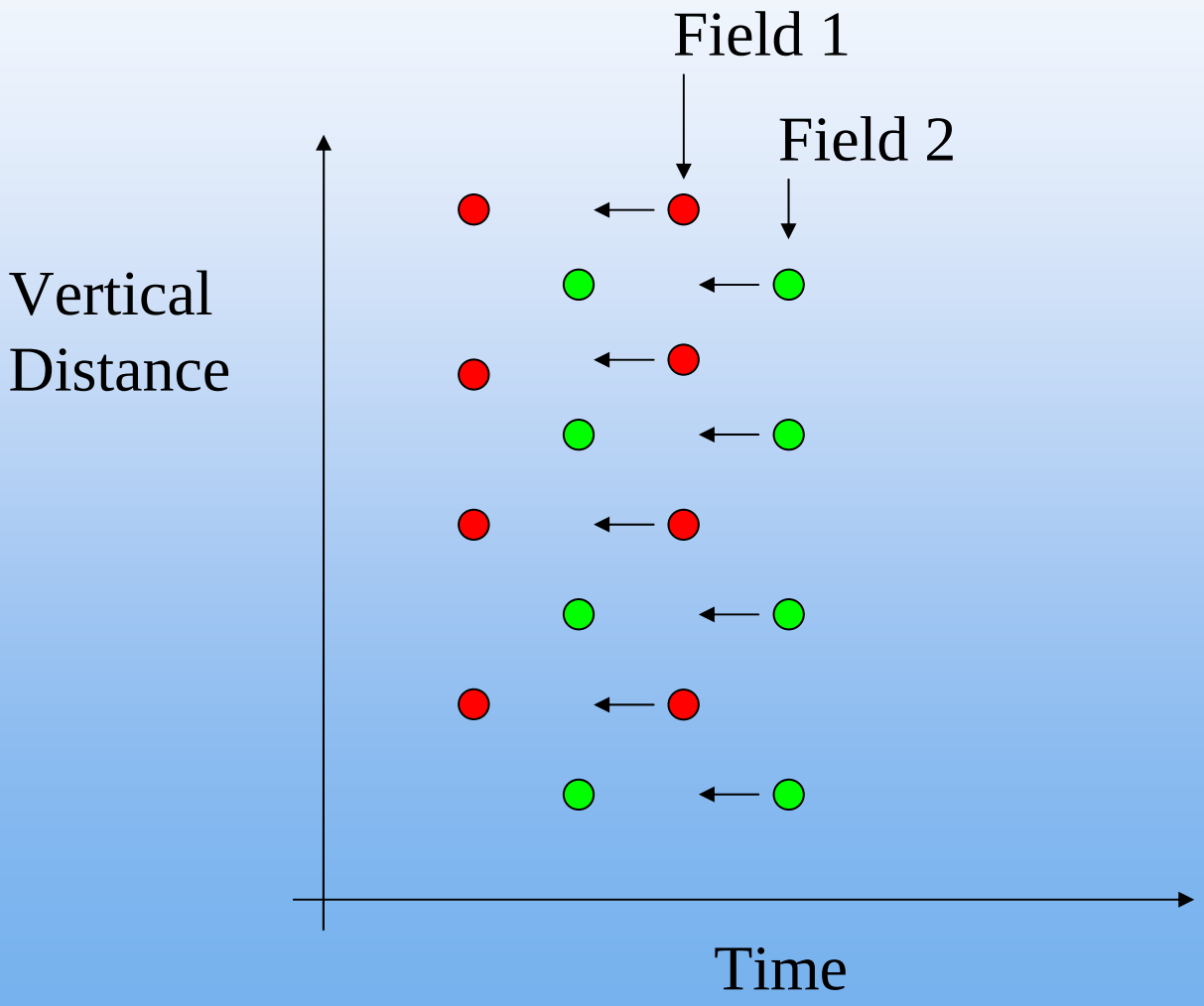
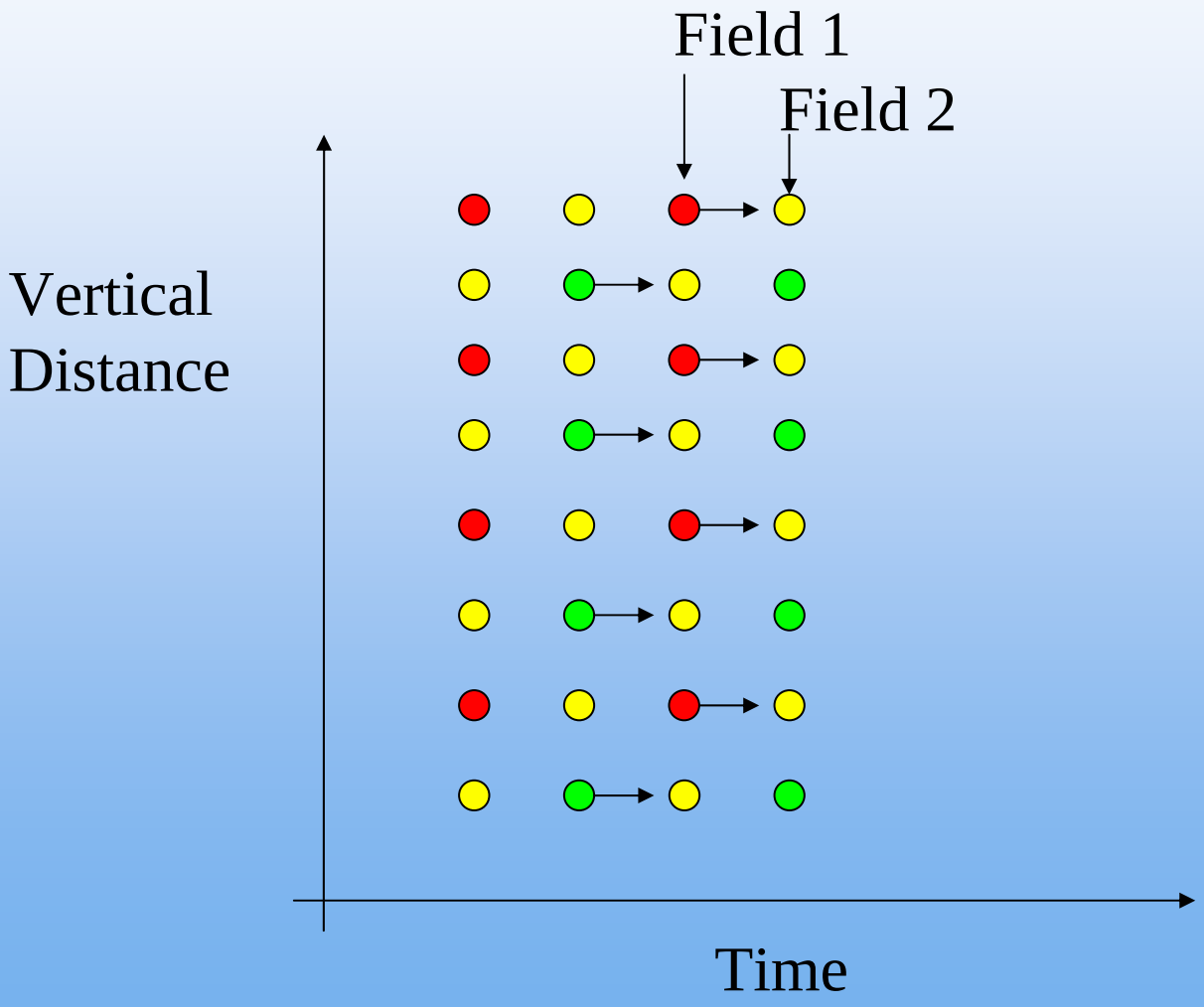
- Motion Estimation
  - Gradient based estimation
  - Hierarchical block matching
  - PhC from Snell & Wilcox
- PhC
  - Motion measurement
  - Maximises resolution
  - Sub-Pixel accuracy
- Processing needs
  - High gate count FPGA from Xilinx & Altera

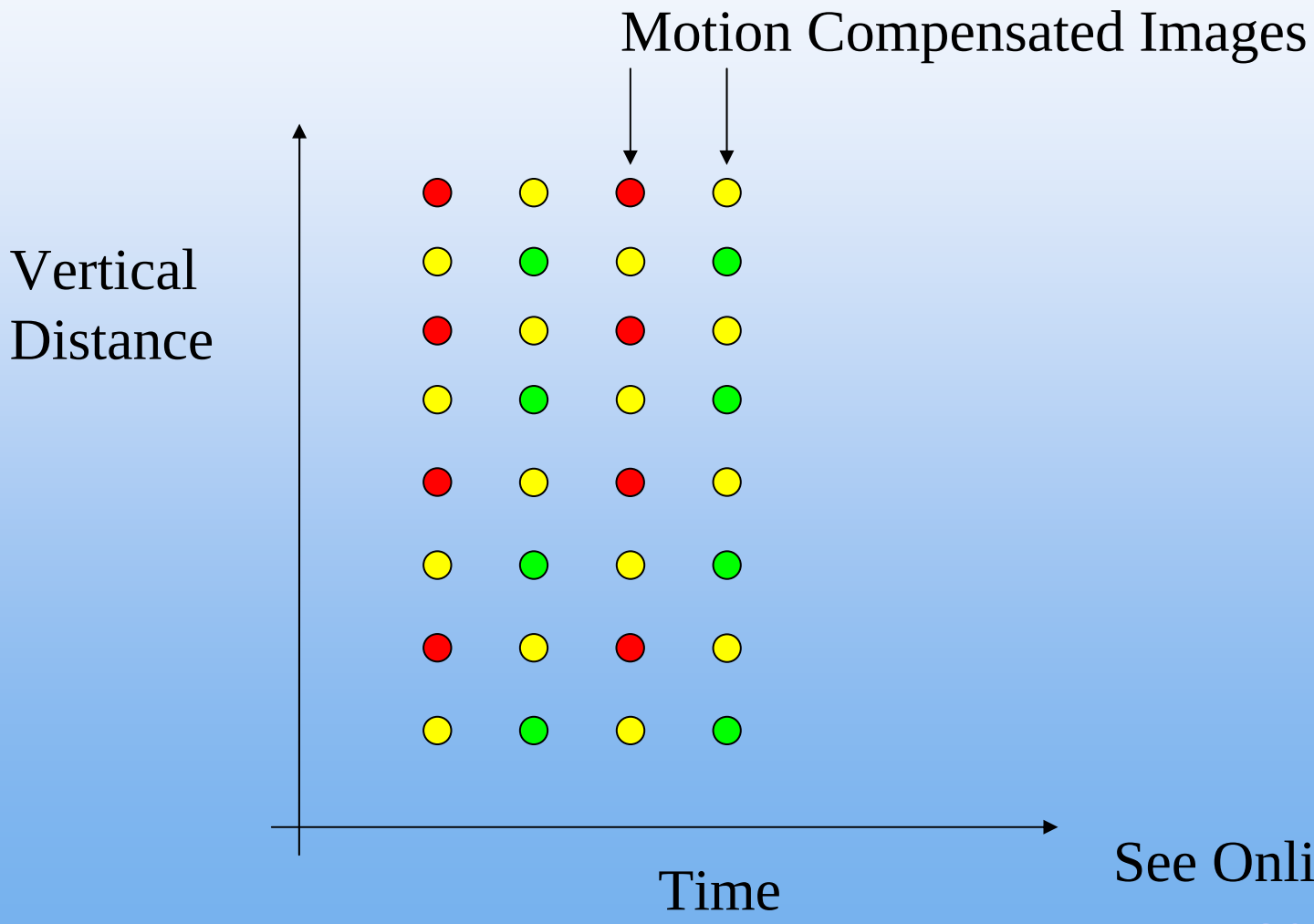
Techniques:
Motion Compensation (2)



Techniques:
Motion Compensation (2)



Techniques:
Motion Compensation (2)



See Online Bookshelf at
www.snellwilcox.com

Conversion Issues

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- Graphics
- Slope
- Titles
- Film

phics(1)

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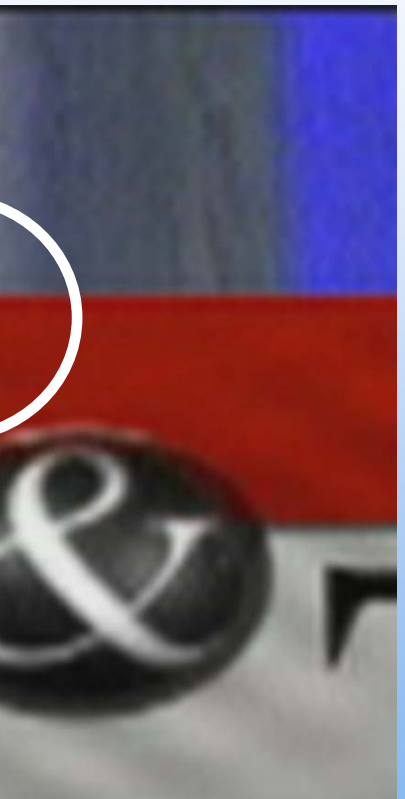

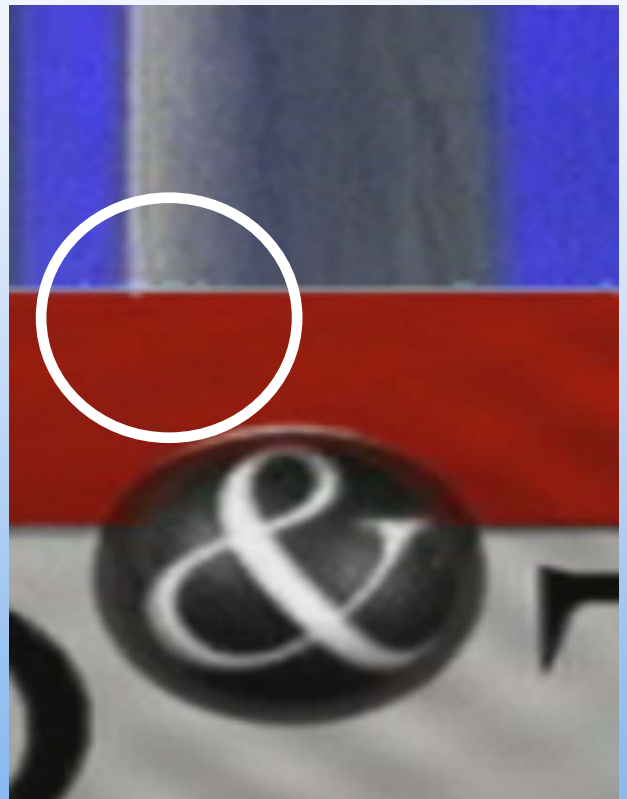

phics(2)

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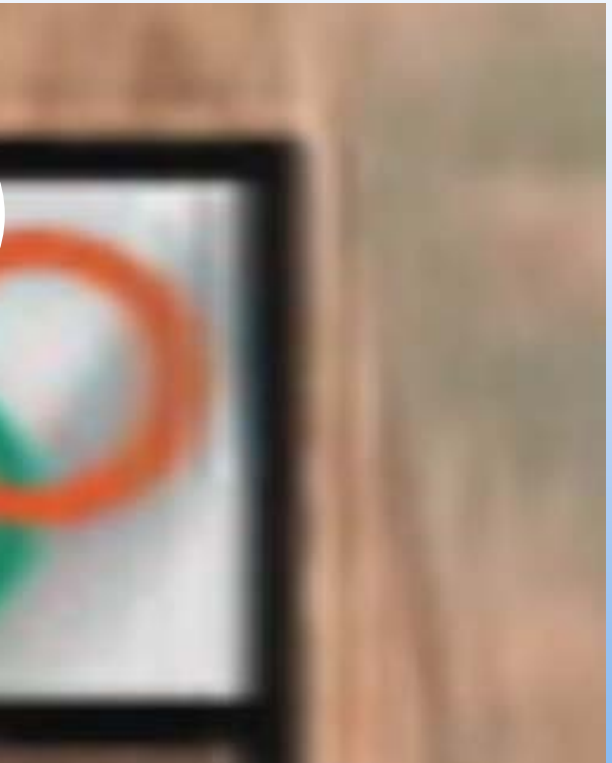

pe (1)

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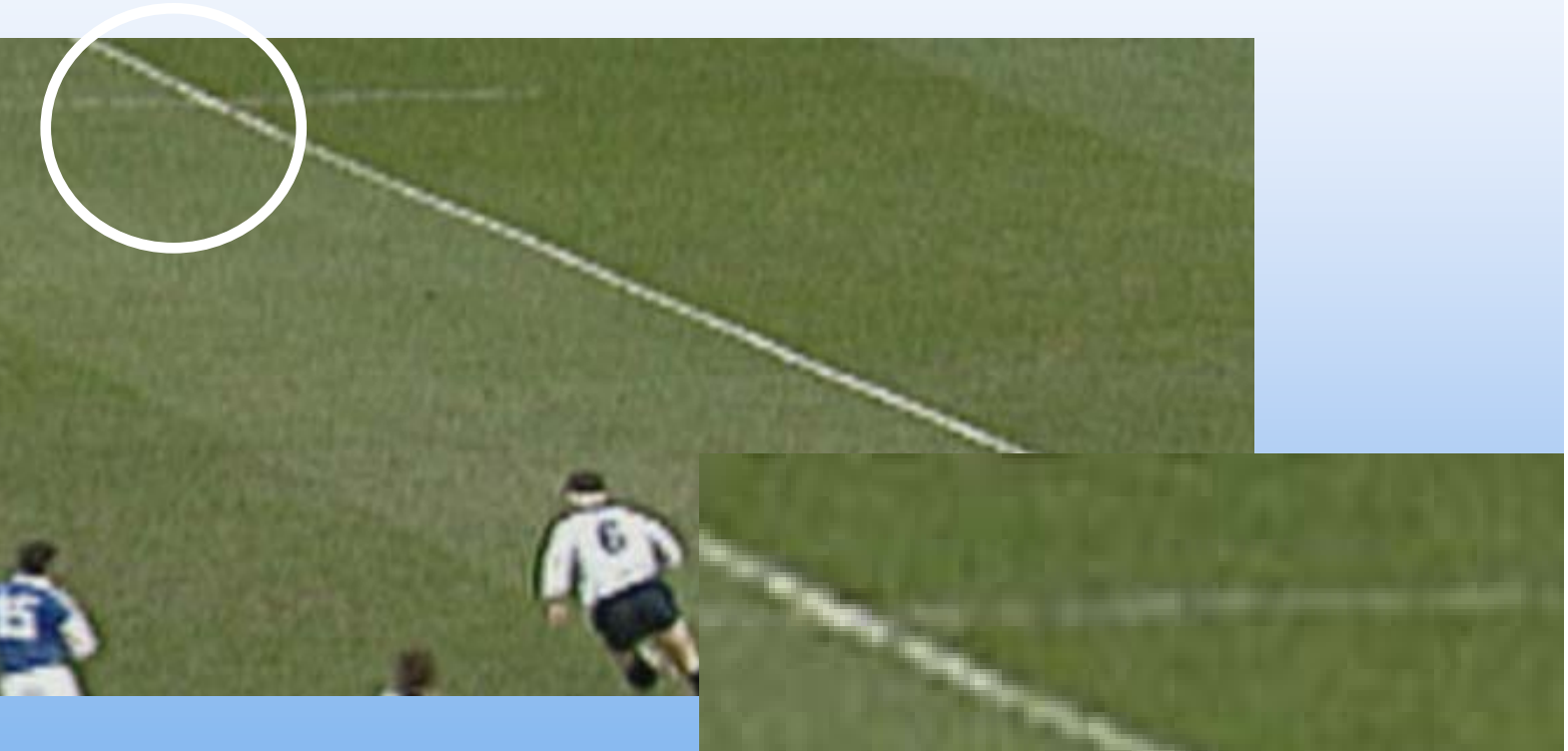

pe (2)

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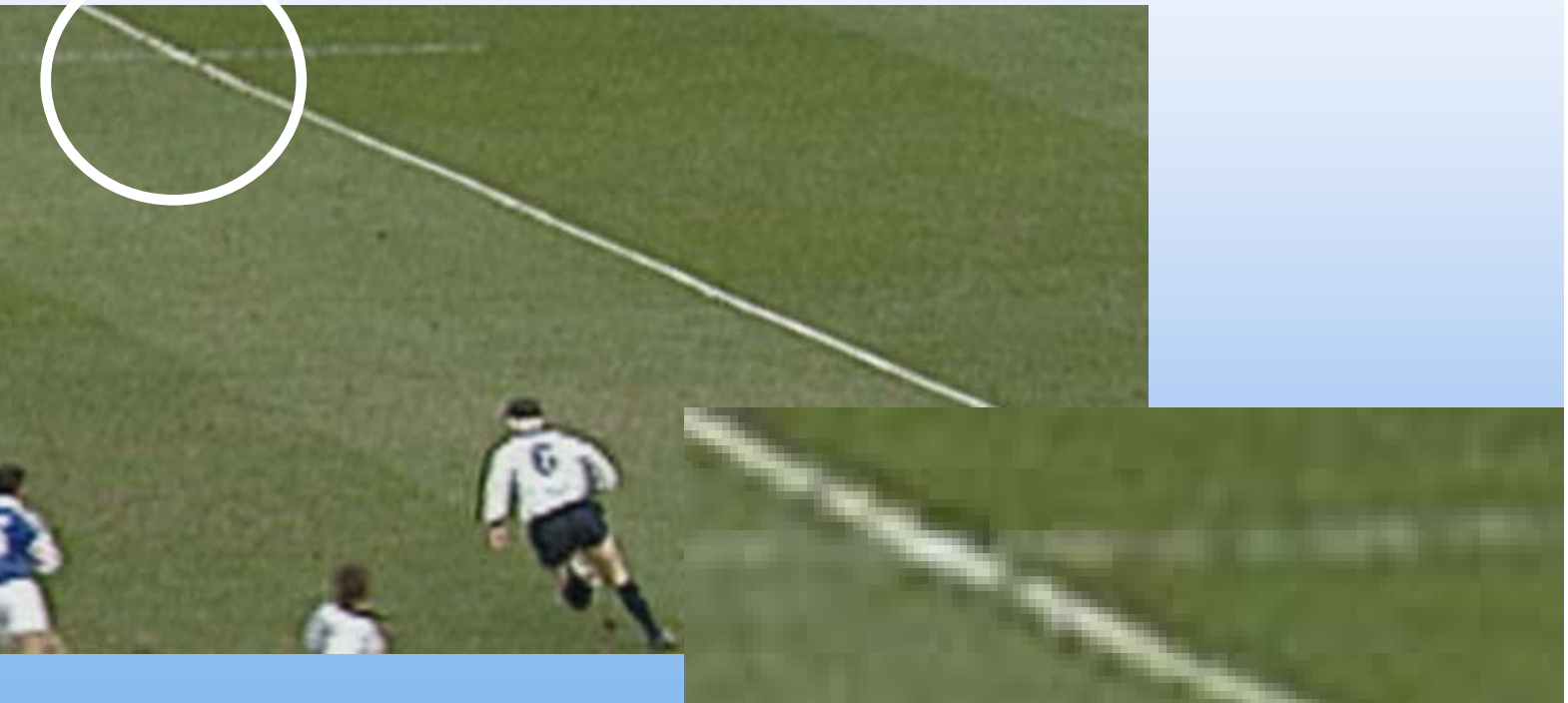

pe (3)

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pe (4)

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es (1)

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